6.0 MITIGATION MONITORING PROGRAM

As the Lead Agency under the CEQA, the CSLC is required to adopt a program for reporting or monitoring regarding the implementation of mitigation measures for this project, if it is approved, to ensure that the adopted mitigation measures are implemented as defined in this EIR. This Lead Agency responsibility originates in Public Resources Code section 21081.6(a) (Findings), and the CEQA Guidelines sections 15091(d) (Findings) and 15097 (Mitigation Monitoring or Reporting).

6.1 MONITORING AUTHORITY

The purpose of a Mitigation Monitoring, Compliance, and Reporting Program (MMCRP) is to ensure that measures adopted to mitigate or avoid significant impacts are implemented. A MMCRP can be a working guide to facilitate not only the implementation of mitigation measures by the Project proponent, but also the monitoring, compliance and reporting activities of the CSLC and any monitors it may designate.

The CSLC may delegate duties and responsibilities for monitoring to other environmental monitors or consultants as deemed necessary, and some monitoring responsibilities may be assumed by responsible agencies, such as affected jurisdictions and cities, and the California Department of Fish and Game (CDFG). The number of construction monitors assigned to the project will depend on the number of concurrent construction activities and their locations. The CSLC or its designee(s), however, will ensure that each person delegated any duties or responsibilities is qualified to monitor compliance.

Any mitigation measure study or plan that requires the approval of the CSLC must allow at least 60 days for adequate review time. When a mitigation measure requires that a mitigation program be developed during the design phase of the project, PG&E must submit the final program to CSLC for review and approval for at least 60 days before construction begins. Other agencies and jurisdictions may require additional review time. It is the responsibility of the environmental monitor assigned to each spread to ensure that appropriate agency reviews and approvals are obtained.

The CSLC or its designee will also ensure that any deviation from the procedures identified under the monitoring program is approved by the CSLC. Any deviation and its correction shall be reported immediately to the CSLC or its designee by the environmental monitor assigned to the construction spread.

6.2 ENFORCEMENT RESPONSIBILITY

The CSLC is responsible for enforcing the procedures adopted for monitoring through the environmental monitor assigned to each construction spread. Any assigned environmental monitor shall note problems with monitoring, notify appropriate agencies or individuals about any problems, and report the problems to the CSLC or its designee.

6.3 MITIGATION COMPLIANCE RESPONSIBILITY

PG&E is responsible for successfully implementing all the Applicant Proposed Measures (APMs) and the Mitigation Measures (MMs) in the MMCRP, and is responsible for assuring that these requirements are met by all of its construction contractors and field personnel. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Other mitigation measures include detailed success criteria. Additional mitigation success thresholds will be established by applicable agencies with jurisdiction through the permit process and through the review and approval of specific plans for the implementation of mitigation measures.

6.4 GENERAL MONITORING PROCEDURES

Environmental Monitors. Many of the monitoring procedures will be conducted during the construction phase of the project. The CSLC and the environmental monitor(s) are responsible for integrating the mitigation monitoring procedures into the construction process in coordination with PG&E. To oversee the monitoring procedures and to ensure success, the environmental monitor assigned to each construction spread must be on site during that portion of construction that has the potential to create a significant environmental impact or other impact for which mitigation is required. The environmental monitor is responsible for ensuring that all procedures specified in the monitoring program are followed.

Construction Personnel. A key feature contributing to the success of mitigation monitoring would be obtaining the full cooperation of construction personnel and supervisors. Many of the mitigation measures require action on the part of the construction supervisors or crews for successful implementation. To ensure success, the following actions, detailed in specific mitigation measures, will be taken:

- Procedures to be followed by construction companies hired to do the work will be written into contracts between PG&E and any construction contractors.

Procedures to be followed by construction crews will be written into a separate document that all construction personnel will be asked to sign, denoting agreement.

- One or more preconstruction meetings would be held to inform all and train construction personnel about the requirements of the monitoring program.

- A written summary of mitigation monitoring procedures would be provided to construction supervisors for all mitigation measures requiring their attention.

6.5 GENERAL REPORT PROCEDURES AND PUBLIC ACCESS TO RECORDS

General Reporting Procedures. Site visits and specified monitoring procedures performed by other individuals will be reported to the environmental monitor assigned to the relevant construction spread. A monitoring record form will be submitted to the environmental monitor by the individual conducting the visit or procedure so that details of the visit can be recorded and progress tracked by the environmental monitor. A checklist will be developed and maintained by the environmental monitor to track all procedures required for each mitigation measure and to ensure that the timing specified for the procedures is adhered to. The environmental monitor will note any problems that may occur and take appropriate action to rectify the problems.

Public Access to Records. The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available for public inspection by the CSLC or its designee on request.

6.6 MITIGATION MONITORING TABLE

The following sections present the mitigation monitoring tables for each environmental discipline. Each table lists the following information, by column:

- Impact (impact number and title);

- Mitigation Measure (includes APM and MM with summary text of the measure);

- Location (where the impact occurs and the mitigation measure should be applied);

- Monitoring/reporting action (the action to be taken by the monitor or Lead Agency);

- Effectiveness criteria (how the agency can know if the measure is effective);
- Responsible agency; and
- Timing (before, during, or after construction; during operation, etc.).

Table 6-1. Mitigation Monitoring Program – Biological Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM BIO-1. Worker Environmental Awareness Program	Entire alignment	Verification of training attendance	Improves awareness and compliance with mitigation measures	CSLC	Before and during construction
	APM BIO-2. Protective Fencing	Entire alignment	Verification of protective fencing	Avoids inadvertent intrusion into sensitive resources	CSLC	During construction
	APM BIO-3. Wetland Protection	Entire alignment	Observation of avoidance and preservation	Protection of wetland areas from project disturbance	CSLC	During construction
	APM BIO-4. Ensure No Western Pond Turtles are Injured or Killed	Bridge removal	Observation of avoidance or relocation	No Western Pond Turtles are injured or killed	CSLC	During bridge removal
	APM BIO-5. Survey for the Giant Garter Snake	Entire alignment	Verification of construction activities only during GGS active season or as determined in consultation with the USFWS	No Giant Garter Snakes are injured or killed	CSLC	Before and during construction
	APM BIO-6. Pre-construction Bird Surveys	Entire alignment	Verification of pre-construction surveys	Avoids disturbance of nesting birds and raptors	CSLC	Before and during construction
	APM BIO-7. Burrowing Owl Surveys	Entire alignment	Verification of pre-construction surveys	Avoids disturbance of burrowing owls	CSLC	Before and during construction
	APM BIO-8. Avoid Elderberry Shrubs	Entire alignment	Verification of buffer zones and avoidance; verification of mitigation ratios	Avoids inadvertent damage to elderberry shrubs; provides mitigation for unavoidable damage	CSLC	During construction
	APM BIO-9. Prepare a Wetland Mitigation Plan	Entire alignment	Review and verification of Plan; observation of avoidance measures	Protection of wetland areas from project disturbance	CSLC	Before and during construction
	APM BIO-10. Wildlife Protection During Construction	Entire alignment	Observation of wildlife protection and avoidance measures	Avoids unnecessary disturbance to general wildlife	CSLC	During construction

	APM BIO-11. Conduct Tree Surveys	Entire alignment	Observation of tree trimming and removal activities	Consistent with County tree protection ordinances	CSLC	During construction
	APM BIO-12. Monetary Compensation to the USFWS	Stone Lakes National Wildlife Refuge	Verification of compensation documentation	Offsets additional easement requirements	CSLC	Project completion
BIO-1: Potential Impacts to Vernal Pools and Vernal Pool Crustaceans	MM BIO-1. Application of Best Management Practices (BMPs)	Entire alignment	Verify application of BMPs	Minimizes potential for impacts to sensitive resources	CSLC	During construction
BIO-2: Potential Impacts to Migrating Fish Species	MM BIO-2. Implement the North Delta Construction Window	Mokelumne and Cosumnes River HDD and bridge removal	Verify construction is completed by November 30th	Avoids impacts to migrating fish	CSLC	During construction
BIO-3: Potential Impacts to California Tiger Salamanders	MM BIO-3. Pre-construction Surveys for California Tiger Salamanders (Attachment 1 to this MMP)	Entire alignment	Verification of pre-construction surveys; observation of removal from worksite	Avoids injury or death of CTS	CSLC	Before and during construction
BIO-4: Potential Impacts to Western Pond Turtles	MM BIO-4. Pre-Construction Surveys for Western Pond Turtle	Entire alignment	Verification of pre-construction surveys	No Western Pond Turtles are injured or killed	CSLC	Before and during construction
BIO-5: Potential Impacts to Giant Garter Snakes	MM BIO-5. Pre-Construction Surveys for Giant Garter Snakes	Entire alignment	Verification of pre-construction surveys; observation of removal from worksite	Avoids injury or death of GGS	CSLC	Before and during construction
BIO-6: Potential Impacts to Tri-colored Blackbirds	MM BIO-6. Pre-construction Surveys for Tri-colored Blackbirds	Entire alignment	Verification of pre-construction surveys; observation of buffer zones	Avoids disturbance of nesting Tri-colored Blackbirds	CSLC	Before and during construction
BIO-7: Potential Impacts to Great Egret, Great Blue Heron, and Double-crested Cormorant Rookeries	MM BIO-7a. Pre-Construction Breeding-Season Surveys	Entire alignment	Verification of pre-construction surveys	Establishes need for MM BIO-7b	CSLC	Before construction
	MM BIO-7b. Avoidance Measures	Entire alignment	Observation of avoidance of active nests	Avoids disturbance of Double-crested Cormorant Rookeries	CSLC	During construction
BIO-8: Potential Impacts to Trees within the Study Area	MM BIO-8. Additional Protection for Sensitive Trees	Entire alignment	Observation of buffer zones	Minimizes disturbance to oaks or landmark trees	CSLC	During construction

Table 6-2. Mitigation Monitoring Program – Geology, Soils, Paleontology, and Mineral Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM GEO-1. Bridge Removal Work Plan	Bridge removal	Verification of workplan	Ensures stability of river banks during construction	CSLC	Before construction
	APM GEO-2. Drilling Plan	Entire alignment	Verification of drilling plan	Maximizes success of HDD	CSLC	Before construction
	APM GEO-3. Drilling Programs	Entire alignment	Observation of HDD drilling activities	Minimizes potential for inadvertent drilling fluid releases	CSLC	During construction
	APM PAL-1. Paleontology Mitigation Program	Entire alignment	Verification of mitigation plan and monitor qualifications; presence of qualified monitors on-site	Evaluates and recovers any potentially significant fossils	CSLC	During construction

Table 6-3. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measure:	APM WQ-1. Verify Well Locations	Entire alignment	Verification that well locations have been verified	Limits the effect that construction will have on local well production	CSLC	Before construction

Table 6-4. Mitigation Monitoring Program – Hazards and Hazardous Materials (includes Pipeline Risk of Upset)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM HAZ-1. Procedures for Encountering Contamination	Entire alignment	Observe construction activities for compliance	Minimizes potential for release of pre-existing contamination	CSLC	During construction
	APM HAZ-2. Fire Protection Plan	Entire alignment	Observe construction activities for compliance	Minimizes personal injury, death, or property damage from fire during construction	CSLC	During construction
HAZ-1: Risk of Serious Injuries and Fatalities Due to Project Upset	MM HAZ-1a. Reduce the Potential for Serious Injuries and Fatalities.	Entire alignment	Observe construction activities for compliance	Minimizes personal injury, death, or property damage from pipeline upset	CSLC	During construction
	MM HAZ-1b. Implement Operation and Maintenance (O&M) Plan.	Entire alignment	Verification of O&M Plan	Minimizes personal injury, death, or property damage from pipeline upset	CSLC	Prior to operation

Table 6-5. Mitigation Monitoring Program – Air Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM AQ-1. Project Wide Fleet-Average NOx and Particulate Reduction	Entire alignment	Review construction vehicle documentation	Exhaust emissions are minimized	CSLC	Before construction
	APM AQ-2. Off-Road Construction Equipment Inventory	Entire alignment	Review construction equipment inventory	Exhaust emissions are minimized	CSLC	Before and during construction
	APM AQ-3. Visual Surveys for Opacity	Entire alignment	Review survey documentation	Visual emission standards are met	CSLC	During construction
	APM AQ-4. Emission Reduction Credits	Entire alignment	This APM has been superseded by MM AQ-1	Project emissions in excess of SMAQMD thresholds are fully offset	CSLC	Before construction
	APM AQ-5. Route Control Valve Fugitive Emissions to the Distribution System	Control valve locations	Review construction drawings	Greenhouse gas emissions (methane) are reduced	CSLC	During construction
AQ-1. Construction NOx Emissions	MM AQ-1. Air Quality Mitigation Fee	Entire alignment	Review mitigation fee documentation	Supports regional air quality improvement	CSLC	Before construction

Table 6-6. Mitigation Monitoring Program – Traffic and Transportation

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM TRA-1. Traffic Control Plan	Entire alignment	Review Traffic Control Plan	Reduces effects of project on local traffic	CSLC	Before construction
	APM TRA-2. Reduce Potential for Roadway Damage	Entire alignment	Observe construction activities	Reduces potential for roadway damage	CSLC	During construction
TRA-1: Work within Public Roadways would Disrupt Traffic Flow	MM TRA-1. Traffic Control Plans	Entire alignment	Review Traffic Control Plan	Reduces effects of project on local traffic	CSLC	Before construction
TRA-2: Work within Private Roadways and Driveways would Disrupt Residential Access	MM TRA-2. Private Party Access	Entire alignment	Verify pre-disturbance notice to residents	Reduces inconvenience to local residents	CSLC	During construction
TRA-3: Construction Activities could Disrupt Emergency Access	MM TRA-1. Traffic Control Plans	Entire alignment	Review Traffic Control Plan	Reduces effects of project on local traffic	CSLC	Before construction

Table 6-7. Mitigation Monitoring Program – Noise

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM NOI-1. Coordinate with Residences	HDD areas	Verify coordination with residences	Provides advance notice of nighttime noise	CSLC	During construction
NOI-1: Nighttime Construction Activities would Disturb Nearby Residences	MM NOI-1a. Restrict Hours of Construction	HDD areas	Observe construction schedule	Avoids nighttime noise where feasible	CSLC	During construction
	MM NOI-1b. Noise Reduction Plan	HDD areas	Observe noise reduction measures	Reduces severity of nighttime noise	CSLC	During construction

Table 6-8. Mitigation Monitoring Program – Cultural Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures:	APM CUL-2. Archaeological Monitoring and Data Recovery Plan	Entire alignment	Verify AMDRP; observe construction activities for compliance	Reduces potential for damage to cultural resources	CSLC	Before and during construction
	APM CUL-4. Unanticipated Discovery of Human Remains	Entire alignment	Observe construction activities for compliance	Reduces potential for damage to human remains	CSLC	During construction
CUL-1: Demolition of an Historic Resource	MM CUL-1: Document the Pipeline Suspension Bridge to Historic American Engineering Record (HAER) Standards	Bridge removal	Verify historic documentation	Preserves historic record	CSLC	Before suspension bridge demolition
CUL-2: Unanticipated Discovery of Cultural Resources	MM CUL-2. Unanticipated Cultural Resource Discovery Procedures	Entire alignment	Observe construction activities	Reduces potential for damage to unknown cultural resources	CSLC	During construction

Table 6-9. Mitigation Monitoring Program – Recreation

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
REC-1: Noise Effects on Wilderness Areas	MM REC-1. Construction Timing	Entire alignment	Verify construction schedule	Reduces noise impacts to recreational uses	CSLC	During construction
REC-2: Bridge Removal Effects on Recreational Boating	MM REC-1. Construction Timing	Entire alignment	Verify construction schedule	Reduces noise impacts to recreational uses	CSLC	During construction
	MM REC-2. Posting of Signs Indicating Bridge Removal Construction Activities	Bridge removal	Verify notification and signs	Minimizes impacts to recreational boaters	CSLC	During construction

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MMP Attachment 1

California Tiger Salamander Survey Protocol

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Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander
October 2003

The Santa Barbara County population of the California tiger salamander (Ambystoma californiense) was federally listed as endangered on September 21, 2000 (65 FR 57242). The Sonoma County Distinct Population Segment (DPS) of the California tiger salamander was listed as endangered on July 22, 2002 (67 FR 47727). The Central California DPS of the California tiger salamander was proposed for listing as threatened on May 23, 2003 (68 FR 28648). The Santa Barbara and Sonoma County DPSs were proposed for reclassification from endangered to threatened, on May 23, 2003 (68 FR 28648). The California Department of Fish and Game (Department) considers the California tiger salamander throughout its entire range to be a species of special concern.
(Special Animals List July 2003 http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf)

The Service and Department have received numerous requests for guidance in planning for the protection of the California tiger salamander (CTS) at the sites of proposed and existing land use activities. This document provides interim guidance for two procedures to accurately assess the likelihood of CTS presence in the vicinity of a project site, including: (1) an assessment of CTS locality records and potential CTS habitat in and around the project area; and (2) focused field surveys of breeding pools and their associated uplands to determine whether CTS are likely to be present.

Because CTS use aquatic and upland habitats during their life cycle, they may be present in either or both habitats on a given property. For sites with suitable breeding habitat, two consecutive seasons of negative larval surveys and a negative upland drift fence study in the intervening fall/winter are recommended to support a negative finding. For sites with no suitable aquatic breeding habitat, but where suitable upland habitat exists, two consecutive seasons of negative upland drift fence studies are recommended to support a negative finding. **If the following Guidance is followed completely, the results of these site assessments and field surveys will be considered valid by the Service and Department.** Results of the site assessments and field surveys should be reported to the appropriate Service's Field Office, if appropriate the Service's Regional Office in Portland, Oregon pursuant to the terms and conditions of the permittee's section 10(a)(1)(A) recovery permit, and to the Department and other agencies or offices as required. Details regarding the recommended content and/or format of reports are provided throughout the remainder of this document.

Surveyors must obtain permission of the landowner before implementing any surveys or research on the CTS. **In locations where the CTS is federally listed surveyors should obtain a Recovery Permit for this species pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, prior to implementing the guidance.** For surveys that may ultimately be used in support of a negative finding, it is recommended that surveyors consult with Service biologists on their study design before beginning work. If surveyors are working in areas with other federally listed species that are likely to be captured incidentally during CTS surveys, surveyors should also possess a valid 10(a)(1)(A) permit for these species (e.g., California red-legged frog, vernal pool tadpole shrimp, etc.). For all locations, the surveyor should hold an active Scientific Collecting Permit from the Department that specifically names CTS surveys as an authorized activity. Authorization Number 9, without explicit permission for handling CTS, is not adequate for CTS surveys.

Site Assessment for the California tiger salamander

Available information about CTS and their habitats in the vicinity of the project should be used to determine the likelihood that CTS may occur there and if field surveys are appropriate. The project proponent should compile and submit to the Service and the Department the following information:

Element 1. Is the project site within the range of the CTS?

The surveyor should review the attached maps or referenced weblink to determine if the project site is within the range of the CTS. For Sonoma County, refer to the attached county map (Sonoma County pdf). For Santa Barbara County, refer to http://www.fws.gov/ventura/es/protocols/ctsfieldsurvey_protocols.pdf . For Monterey, San Benito, and San Luis Obispo counties, contact the Ventura Fish and Wildlife Office at the address provided below. For all other areas, refer to the attached map of California (all of California pdf).

Element 2. What are the known localities of CTS within the project site and within 3.1 miles (5.0 kilometers) (km) of the project boundaries?

This is to place the project site in a regional perspective. The surveyor should consult the California Natural Diversity Data Base (CNDDB) maintained by the Department to determine known localities of the CTS. The Sacramento or Ventura Fish and Wildlife Offices should be contacted for localities within their respective jurisdictions. Other information sources on local occurrences of CTS should be consulted. These sources may include, but are not limited to, biological consultants, local residents, amateur herpetologists, resources managers and biologists from municipal, state, and Federal agencies, environmental groups, and herpetologists at museums and universities. The surveyor should note in their report all known CTS localities within the project site and within 3.1 miles of the project boundaries; if there are no localities within 3.1 miles, the nearest locality should be noted.

Element 3. What are the habitats within the project site and within 1.24 miles (2 km) of the project boundaries?

This distance is based on the observed mobility of the species. Describe the upland and aquatic habitats within the project site and within 1.24 miles of the project boundaries. Characteristics of the site that should be recorded include acreage, elevation, topography, plant communities, presence and types of water bodies, fossorial mammal species and their burrows, current land use, a description of adjacent lands, and an assessment of potential barriers to CTS movement. Use of aerial photographs is necessary to characterize potential breeding habitats that are not part of the project site under consideration. The aquatic habitats should be mapped and characterized (e.g., natural vernal pools, stockponds, drainage ditches, creeks, types of vegetation, surface area, depth, approximate drying date). Suitable upland habitat, including locations of underground refugia, for CTS should be mapped as well, with a focus on areas where small mammal burrows are located or are most dense.

Reporting and interpretation of the site assessment
Site assessments should include, but are not limited to, the following information: (1) photographs of the project site(s); (2) survey dates and times; names of evaluator(s); (3) a description of the site assessment methods used; (4) a list of CTS localities, as requested above; and (5) a map of the site(s) showing habitat as requested above. Maps should be of similar nature to a U.S. Geological Survey (USGS) 7.5-minute (1:24,000) topographic maps -or- Geographic Information System (GIS) data depicting the site(s) and the area within 5 kilometers (3.2 miles) of its boundaries. The report should be provided to the appropriate Service field office and Department regional office prior to initiating field surveys.

After completing items 1-3 of the site assessment (as above), send a report to the appropriate Service field office and Department regional office. Based on the information provided from the site assessment, the Service and Department will provide recommendations as to the appropriateness of field surveys. Surveys should not be initiated until recommended by the Service and Department.

Interim Presence/Negative Finding Survey Guidance for the California Tiger Salamander

Biological field surveys should be conducted for all sites with potential CTS habitat. Due to its unique life history, the CTS can be difficult to detect depending on weather and time of year. Aquatic sampling for larvae

during spring months can be the most effective way to determine if CTS are present in a given area. However, especially if environmental conditions are unfavorable, CTS may not breed successfully in a given year. After metamorphosis CTS spend most of each year on land, emerging from refugia only occasionally, usually on rainy nights. CTS have been observed on land 1.24 miles from any potential breeding pool.

At sites that contain both upland habitat and potential breeding habitat (i.e., pools that contain standing water continuously for at least 10 weeks, extending into April), aquatic sampling during two breeding seasons and a drift fence study in the intervening winter should be conducted to support a negative finding. At sites that contain appropriate upland habitat only, but where there is a known or potential breeding site accessible within 1.24 miles, a two-year drift fence study should be conducted.

In years with little rainfall, upland emergence may be reduced and CTS may not breed. Field surveys conducted in years with at least 70% of average rainfall between September 1 and April 1, at the nearest National Oceanic and Atmospheric Administration climate station are most reliable. Data from survey seasons not meeting this criterion will also be considered; surveyors should provide strong justification that their data are reliable including but not limited to local climate (e.g., daily rainfall totals, pond filling date, pond drying date) and biological survey data (e.g., other species captured during each sampling interval).

Aquatic larval sampling

1. Aquatic larval surveys of potential breeding pools should be repeated three times each season. Surveys should be conducted once each in March, April, and May, with at least 10 days between surveys. **If pools are likely to dry prior to the completion of three surveys, the sampling schedule should be shifted accordingly.**

2. Captured CTS should remain in nets for the minimum amount of time necessary, but no longer than 5 minutes. During this time, larvae should not be kept out of water for more than 30 seconds. Photographs should document a representative sample of captured CTS.

3. Disruption to the pond's bottom should be minimized. Shallow areas where young larvae may occur should be traversed in the most direct and least disturbing manner possible.

4. Sampling should cease once presence has been determined to minimize disturbance of pool flora and fauna. If CTS are detected at a pond, subsequent visits to that pond are not necessary.

5. Ponds should be initially sampled using D-shaped or similar, long-handled dipnets with 1/8th inch (3.2mm) or finer mesh. If CTS larvae are not captured in the first 50 dipnet sweeps, covering representative portions of the pond, seines should be used.

6. If dipnetting has been unsuccessful, seines should be used to sample 100% of the surface area of ponds smaller than 1 acre and at least 30% of the surface area of larger pools, including a representative sample from different water depths and vegetated and non-vegetated areas. One eighth inch (3.2 mm) or finer mesh minnow seines with weights along the bottom and floats along the top edge should be used, with dowling or PVC pipe attached to the end of the seine so the bottom edge can be dragged along the bottom of the pool. Whenever possible, the seine should be pulled from one edge of the pond to the other.

7. Use of minnow traps will be considered on a case-by-case basis. Minnow trapping for CTS larvae should only be conducted in habitats that are too deep to adequately survey with dipnets and seines, or in which dense vegetation impedes normal dipnetting/seining activities. **In these cases the surveyor should submit to the Service a written minnow trap sampling design based on the requirements**

detailed below. No minnow trapping should be conducted in ponds known to support state or federally threatened or endangered animals (e.g., California red-legged frogs (Rana aurora draytonii)). In areas where California red-legged frogs may occur, minnow trapping should be preceded by negative surveys following the Service guidelines for this species. To conduct minnow trap sampling in pools known to contain California red-legged frogs, surveyors must possess a valid Recovery Permit for this species pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended.

8. Minnow trapping should be conducted in the following manner:

a. Minnow traps should be monitored for three three-day intervals between March 1 and May 15 (for a total of nine days of trapping per site). Trapping intervals should be separated by at least ten days. Minnow trap surveys should immediately cease if CTS presence is determined.

b. Minnow trapping should be avoided during warm periods when air temperatures reach 80 degrees Fahrenheit or when water temperatures reach 70 degrees Fahrenheit or warmer, to prevent the possibility of mortality due to reduced oxygen availability.

c. Minnow traps should be deployed overnight and checked frequently enough to ensure that larvae are not killed or injured. Traps should be checked at least once per day.

d. A minimum of four traps should be placed in each pond. For larger ponds, traps should be distributed along the shoreline with no more than 75 ft (23 m) between traps. Each trap should be clearly marked with the name, telephone number, and State and Federal permit number of the surveyor. Traps should be anchored to stakes set near the shoreline. Steel braided fishing line or heavy cord works well for this purpose; galvanized wire and stainless steel wire should not be used because these wires may kink and break. If livestock are present, we recommend that the surveyor devise a method to anchor the trap in a manner to prevent entanglement of livestock. Brightly colored flagging should be affixed to each anchor point. For extra security, a float attached to each trap can aid in detection. If a minnow trap is lost, every effort should be made to recover it to avoid the possibility of leaving behind a trap that can kill a variety of species over time.

e. Traps should be deployed to the deepest parts of ponds and in shoreline areas with aquatic vegetation growth.

9. Data regarding the type and quality of each pool sampled should be recorded. At a minimum, these data should include the date and time, location, type of water body (e.g., vernal pool, seasonal wetland, artificial impoundment, etc.), dimension and depth of pond, water temperature, turbidity, presence of aquatic vegetation (submergent and emergent), and dominant invertebrates and all vertebrates observed. Photographs of pools and adjacent upland areas are helpful and copies should be included in the final report.

10. Surveyors should follow guidance below for disinfecting equipment and clothing after surveying a pond and before entering a new pond, unless the two ponds are hydrologically connected to one another. These recommendations are adapted from the Declining Amphibian Population Task Force's Code which can be found in their entirety at: http://www.open.ac.uk/daptf/ .

a. All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, should be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water. Cleaned items should be rinsed with clean water before leaving each study site.

b. Boots, nets, traps, etc., should then be scrubbed with either a 70 % ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT 128 (quaternary ammonium, use 1:60 dilution), or a 6% sodium hypochlorite 3 solution and rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of a pond or wetland should be avoided. Care should be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.

c. When working at sites with known or suspected disease problems, disposable gloves should be worn and changed between handling each animal.

d. Used cleaning materials (liquids, etc.) should be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

Upland Habitat Survey Methods

A drift fence study conducted during fall and winter is the primary method used to study CTS in upland habitats. To support a negative finding, an upland drift fence study should be included. Although less intrusive methods (see below) may also be used to determine presence of the CTS, these methods are less reliable and thus cannot be used to support a negative finding.

Because CTS have been observed to make breeding migrations of at least 0.6 miles (1 km), the project proponent or the Service may assume presence of CTS if a known breeding pond lies within 1 km and no significant barriers exist. Examples of significant physical barriers include high-density residential or urban development and Interstate Highways, while features such as golf courses, disked fields, and most paved roads are not considered barriers.

For sites with at least one accessible potential breeding pool, we recommend that a one-year drift fence study be conducted during the winter between two consecutive seasons of aquatic larval surveys (if presence of CTS was not established during the first season of aquatic sampling). We recommend that a two year drift fence study be conducted if: 1) a site has suitable upland habitat and a potential breeding pool lies within 1.2 miles (2 km); 2) on-site ponds cannot be adequately sampled using aquatic methods (e.g., deep impoundments with known presence of California red-legged frogs); or 3) if non-native predators or poor water quality may preclude detection of CTS during larval sampling (i.e., due to mortality of the larvae).

1. We recommend that a proposal to conduct a drift fence study be submitted in writing to the Service and the Department. The results of studies not approved by the Service and Department may not be accepted in support of a negative finding. The proposal should include an aerial photograph of the study site indicating all potential on- and off-site breeding locations identified in the site assessment and an overlay with the proposed drift fence study design clearly delineated. We recommend that drift fence study designs incorporate the following:

    a. **For sites with at least one suitable breeding pond** (i.e., ponds that contain standing water for at least 10 continuous weeks in most years), the ponds should be surrounded by drift fences installed 10 - 50 ft from the high water line. Sections of drift fence should be spaced regularly around the pond, focusing on areas where salamanders are most likely to be captured. We recommend that each section of fence be at least 30 ft (9.2 m) long, and that the total distance between fence sections be no greater than the total length of installed fence (i.e., >50% of the circumference fenced). There should be no more than 33 ft (10 m) between pitfall traps, and drift fences should be constructed such that during periods when traps are closed, openings at least every 66 ft (20 m) allow animal passage.

b. **For all sites**, we also recommend upland drift fences. Unless a strong rationale can be presented, drift fence equaling at least 90% of the site perimeter should be installed. The exact placement of fences should be selected to maximize the probability of capturing CTS (e.g., in grassland areas with high densities of mammal burrows; along site boundaries closest to identified potential breeding pools; with pitfalls situated away from areas where flooding is likely). Pitfalls should be spaced less than 33 ft apart. To the extent possible drift fences and pitfalls should be placed to minimize the number of flooded buckets. Each section of fence should be a minimum of 30 ft (9.2 m) long, unless topography, property lines, or other circumstances dictate. Upland drift fences should be constructed such that during periods when traps are closed, openings at least every 66 ft (20 m) allow animal passage.

2. Arrays should be approved and constructed by 15 October. Beginning on or before October 15, pitfall buckets should be opened before sunset if there was any rain during the day or if at 2 PM rain is forecast for the remainder of the day or subsequent night with 70% or greater probability (based on the nearest National Weather Service forecast - available at http://www.wrh.noaa.gov/Sacramento/). Traps should be open each night and checked each morning until no rain has fallen within the preceding 24 hours. Nights of high relative humidity (greater than 75% relative humidity) should be considered equivalent to rain events once onsite or nearby seasonal wetlands have become inundated with standing water, regardless of its depth, surface area, or duration. The above guidance should be followed until 20 nights of surveying under the proper conditions has been conducted. After 20 nights of surveying is completed, and until March 15, pitfall buckets should be opened before sunset if there was any rain during the day, or if at 2 PM rain is forecast for the remainder of the day or subsequent night with 70% or greater probability. Traps will be checked the next morning, and unless it is still raining or more rain is forecast, the traps can be closed until the next rain event.

3. Drift fences should be constructed from a material that is durable, weather resistant, and **appropriate for the area in which it will be installed; proposals should describe the materials to be used**. Examples include aluminum flashing, silt fencing, untreated wood particle board, shade cloth, window screen, Vexar plastic mesh, etc. Hardware cloth may be useful for short segments of fence that experience heavy overland water flow. Drift fences should be buried at least 3 inches (8 cm) underground and extend at least 1 ft (31 cm) above the ground. All drift fences require regular inspections and maintenance, especially after each significant storm event. If drift fences are installed incorrectly and/or have insufficient maintenance this may call into question the reliability of the data. Unless special authorization is received from the Service and Department to maintain drift fences through non-sampling months, drift fencing should be disassembled by April 1.

4. Pitfall traps should not be placed in a manner that will disturb or destroy rodent burrows or other refugia that could be used by CTS.

5. Excessive pitfall flooding may invalidate a study. To avoid flooding traps should be placed preferentially in slightly elevated locations where flooding is less likely. Pitfalls in locations likely to flood should be free of holes. If ground saturation forces a pitfall out of the soil it can be weighted down with cement, gravel or other suitable materials.

6. All pitfall traps should have a rigid lid that closes securely. When not in use, traps should be closed in a manner that precludes entry by CTS and other animals.

7. Pitfall traps should be cylindrical, non-galvanized, metal or plastic containers. They should be at least 2-gallons in size and 8 in (20 cm) deep.

8. Each pitfall trap should contain noncellulose sponges or other nontoxic absorbent material which should be kept moist at all times.

9. Each pitfall trap should have a rigid cover with legs one to two inches high to provide shade and shed water during extreme rain events.

10. When in use, pitfall traps should be checked as often as necessary, but at a minimum one time a day, with one of these checks occurring between one hour before sunrise and noon. Whenever possible, traps should be opened just before dark and checked and closed the following morning.

11. When not in use, the drift fence and pitfall traps should be inspected weekly to ensure the system has not been disturbed by vandals, wildlife, fallen trees, wind, etc. Repairs to fences should be completed prior to the next night of sampling.

12. Pitfall traps should be placed as far as possible from ant nests. If an ant nest develops within 10 feet of an existing pitfall trap, the pitfall trap should be moved, removed from the field, or closed.

13. Captured CTS should be released as near as possible to the point of capture, in a manner that maximizes their survival. CTS should be released into the mouth of a small mammal burrow or other suitable refugia. CTS should be watched after release to be sure that they are in a safe location and are not susceptible to increased predation risk.

14. Once a CTS is captured, all traps and drift fences should be emptied and removed within 24 hours, and holes in the ground which contain traps should be filled in.

15. In addition, to minimize mortality of small mammals that may become trapped during surveys, each pitfall trap should also incorporate either jute twine, as described in Karraker (2001; http://www.fs.fed.us/psw/rsl/projects/wild/karraker/karraker4.pdf), a rodent safe-house as described in Padgett-Flohr and Jennings (2001), or other material as approved by the Service and Department.

16. Each pitfall trap should be marked with the name, telephone number, and Department permit number.

Other methods

Other methods, such as visual egg surveys, night driving, nocturnal surveys, fiber optic scoping and cover-boards, may be used to determine presence of the CTS, but these techniques may not be accepted in support of a negative finding. Deviations from this guidance may be approved on a case-by-case basis if a strong rationale can be presented.

Reporting

If one or more CTS are captured or detected a representative sample of the embryo(s), larva(e), or transformed salamander(s) should be photographed. The Service and the Department should be contacted by telephone within 3 working days if CTS are captured. If any mortality of California tiger salamander occurs, specimens should be collected, preserved by freezing, and the Service and the Department contacted by telephone within 1 work day.

For each survey location, a final report detailing the survey results should be submitted to the Service and the Department within one month of the last site visit. The written report should include, but is not be limited to, the following information: names of surveyors and copies of permits and authorizations, a description and map at the appropriate resolution of the type and quality of upland and aquatic habitats and land uses at the site; a map indicating the location of water bodies sampled for larvae; a map indicating the location of drift fences and pitfalls. The survey report also should include survey methods used, the dates and times of surveys, rainfall

totals by date, nightly minimum temperatures, number and length of dipnet sweeps made, number of passes with seine, total estimated area seined, records of upland and aquatic animals captured, and pond water temperature, turbidity, and maximum depth at each aquatic sampling. If CTS are detected on the site, the report should include a map indicating the precise location of all CTS observations and captures, the number of CTS egg masses, larvae, sub-adults and adults observed, and photographic verification of CTS from the site. Site photographs may also be helpful in interpreting survey results. For the Department, survey reports should also include CNDDB field locality forms. Locality information should be in the form of UTM or latitude/longitude (degree, minute, second) coordinates.

In the case of a negative finding including a season with 70% of average rainfall, additional information (e.g., pond filling/drying dates, quantity and timing of rainfall during each sampling interval, temperatures) supplied by the surveyor, may assist the Service and the Department in their decision whether or not to accept the data.

Contact Information:

U.S. Fish and Wildlife Service

For an application or guidance on how to obtain a Federal permit or for reporting, please contact:

For areas within the Great Valley hydrobasin:

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
Attn: Permit Coordinator 2800 Cottage Way, W-2605
Sacramento, California 95825
(916) 414-6547

For hydrobasins south of and including Santa Cruz County:

U.S. Fish and Wildlife Service
Attn: Permit Coordinator
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B Ventura, California 93003
(805) 644-1766

http://www.fws.gov/endangered/permits/

Please refer to http://www.fws.gov/ventura/areas/responsibilities.html or http://www.fws.gov/sacramento/sfwo_jurisdiction.htm for a map showing U.S. Fish and Wildlife Office jurisdictions.

California Department of Fish and Game

For Department reporting or questions regarding land use activity guidance, a map of regional offices and telephone numbers is available at http://www.dfg.ca.gov/regions/regions.html

For State of California Scientific Collecting permit applications and information, please contact:
California Department of Fish and Game
License and Revenue Branch
3211 S Street
Sacramento, California 95816
(916) 227-2271

For additional State permit information, please refer to:

http://www.dfg.ca.gov/hcpb/ceqacesa/ceqacesa.shtml (How to Obtain a Scientific Collecting Permit)

http://www.dfg.ca.gov/hcpb/ceqacesa/rsrchpermit/mou/whenneedmou.shtml (When is the MOU Required?)

http://www.dfg.ca.gov/licensing/pdffiles/fg1476.pdf (Scientific Collecting Regulations)

http://www.dfg.ca.gov/licensing/pdffiles/fg1379e.pdf (Scientific Collecting Permit Attachment)